

Preface

The traditional approach to design of manufacturing systems is the hierarchical approach. The design is based on a top-down approach and strictly defines the system modules and their functionality.

Communication between modules is strictly defined as a one way and limited in such a way that modules are allowed to communicate only with their parent and child, where the parent sets constraints on the child, and the child set constraints on the following module parent.

For example: a process planner set the routing for each item. Production planning regards this routing as a constraint. It must plan capacity planning using this specific routing. In case of overload, or disruptions, it must search a solution with sophisticated theory of constraint mathematic algorithms. He is not allowed to search for technological solution, i.e. another routing.

Process planning was regarded as an art and not a science, therefore, the intentions, ideas and optimization used in formulating a routing are unknown, and it is a constraint.

Research developments proposed several computer aided process planning programs, where the user may generate a routing to his specifications and optimization without the support of a process planner. (The process planner task is redefined).

This option converted the process planning from art to science where routing should not anymore be a constraint, but a tool for user. For example, the production planning will solve scheduling problems by generating another routing.

Such option introduced flexibility to the manufacturing process. The stumbling block between manufacturing modules can be removed. The decisions made at each stage become observable, controversial and doubtful.

While restructuring the manufacturing process and preparing computer program, detailed specifications for any decision to be made had to be carefully analyzed and tested, and consult with the appropriate specialist(s) in the field. This stage conspicuous expose that there is a mix of experts interest in several manufacturing modules. Some decisions are engineering ones, but they affect economics interest, therefore they should be involving management decision or at least authorization.

This book intention is to enlighten engineering and management to where are the boundaries for making decision without the consent of management. Engineering

must make operational decision but should be careful not to jeopardize company profitability. Such contravention areas are presented and discussed.

On the other hand management should consult with engineering concerning technological decisions.

The method of presentation is by dedication a chapter to each stage of the manufacturing process. The theme of the chapter is described. Assuming that the technological matters are handled satisfactory by the engineering professionals, therefore they are not referred in this book. However, the subjects which are calls for economic consideration, and therefore, management involvement is needed are marked as a section "Management control". The reasons are detailed and explained.

<http://www.springer.com/978-3-319-03469-0>

Industrial Management- Control and Profit
A Technical Approach

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2014, X, 273 p. 107 illus., Hardcover

ISBN: 978-3-319-03469-0